

V. *Descriptions of some Coleopterous Larvæ, &c.* By JOHN CURTIS, Esq., F.L.S., &c.

[Read 3rd April, 1854.]

I HAVE the pleasure of calling the attention of the Entomological Society to a few interesting larvæ, of which hitherto no figures have been published, with the exception of one species.

The very excellent and useful volume which lately issued from the press at Liege* will greatly assist in the investigation of the larva-state of the *Coleoptera*; and the figures there given, from the pencil of one of the authors, add greatly to the value of the Memoir.

It is not however in the grouping of genera, I expect, that so much benefit will be derived from a knowledge of the larva of insects as was at one time anticipated; we need only take a glance at the *Papilionidæ* to be convinced, that instead of unity there is frequently as great a difference amongst themselves as can be exhibited between that natural family and any other belonging to the order *Lepidoptera*.† I am, however, far from rejecting the larvæ in systematic arrangement, when their forms assist in combining groups, whether of families or genera. The great value which attaches to a knowledge of the economy of insects arises from its connection with the economy of the human species, whether we consider insects as the enemies or benefactors of man; destroying the hopes of the agriculturist and the gardener, or supplying the *staple* in the arts and manufactures.‡

Family STAPHYLINIDÆ.

Genus VELLEIUS. (Plate V. fig. 1.)

Sp. 1. *V. dilatatus*, Fab.

Elongated, but slightly depressed, narrowed anteriorly, smooth, sparingly clothed with short hairs. Head oval, depressed (fig. 2,

* Catalogue des Larves des Coléoptères, par M. F. Chapuis et M. E. Candèze. 1853.

† Vide the larvæ of our two species of *Papilio*, *Podalirius* and *Machaon*, the genus *Acronycta*, &c.

‡ From the able and long-continued experiments of my friend Dr. Chavannes of Lausanne I expect some very important discoveries will result. He has been able, if I mistake not, to obtain as good and fine silk, as that from the common silk-worms, from the cocoons of caterpillars, which are larger and much harder in their nature than those from China.

underside); eyes invisible; clypeus deeply indented, forming eight teeth, with a ninth in the centre, and several long rigid hairs (fig. 3); mandibles crossing, long, slender, curved and very acute (fig. 4); maxillæ forming a long horny lobe, arising from a stout scape, terminated by a claw internally. Palpi triarticulate? (fig. 5, with the palpus broken). Mentum horny, narrowed at the middle, terminated by a large ciliated lip, with a minute biarticulate palpus, attached to a stout scape at each angle; basal joint oblong, second conical (fig. 6). Antennæ inserted on each side of the clypeus, not very remote, slender and four-jointed (fig. 2 a). Prothorax attached by a short neck, a little broader than the head towards the base, subquadrate, the anterior angles rounded; two following segments a little broader, transverse. Abdomen soft and nine-jointed, with eight distinct stigma, ochreous-white, broader than the trunk at the middle, tapering towards the extremity, each segment having an oval fulvous spot on each side, forming two rows down the back; these spots are punctured, with minute tubercles, and there are several punctured ferruginous tubercles on the hinder margin of each spot; terminal segment conical (fig. 7), producing a drooping cylindrical ochreous pro-leg (fig. 7 a), with a jointed divaricating style on each side at its base; first joint long and stoutish, second shorter and slender (fig. 7 b). Legs long, slender, spiny (fig. 8, a middle leg); coxæ large, trochanters small, thigh long and very spiny beneath; tibia shorter and slenderer, but spiny inside; claws long, slender and very acute.

The following is Professor Henslow's account of this larva:—
“I took about thirty or forty specimens of *Velleius* from the hornet's nest, by placing a bowl under it, into which most of them fell within a month of the time after it had been brought home (18th October). Some I picked off the lowest and exposed lamina of the comb, as they were actively traversing it, and poking their heads into the cells in search of food; most of these were placed in a glass jar among rotten wood in a powdered state. They burrowed in this, and I could see many of them alive in March, each in a separate cavity, which he had formed for himself against the bottom or side of the jar. I am sorry, and rather ashamed to say, that my over-care for their welfare destroyed them. Thinking they were getting too dry, I poured in a little water once or twice, and, after an absence of three or four days on one occasion, I found they were dead.”*

* The Zoologist, vol. vii. p. 2585.

This unfortunate accident not only deprived many a cabinet of this fine beetle, but we have no direct evidence of the larva being the offspring of *Velleius*, although, from its economy and its organization, it is scarcely to be doubted. My friend Professor Henslow kindly forwarded to me specimens, but, having died before they were put into spirits, they were mutilated, which renders my magnified figures and dissections somewhat imperfect, and possibly not entirely to be relied upon in a few minor points.

Family ELATERIDÆ.

Genus *ATHOUS*. (Plate V. fig. 9.)

Sp. 2. *A. rhombeus*, Oliv.

Long, linear, plano-convex, with a channel along the back; pitchy, shining, with a few longish hairs. Head depressed, wedge-shaped, semiorbicular (fig. 10); eyes none; clypeus with a conical tooth in the centre; labrum undiscovered; mandibles meeting, arched and acute (fig. 10 *a*); maxillæ broad at the apex, and terminated by a minute, biarticulate, palpiform lobe (fig. 10 *b*). Palpi short and 4-jointed, basal joint the largest; 2nd smaller, both subobovate, truncated; 3rd smaller, cup-shaped; 4th very small, and somewhat conical (fig. 10 *c*); mentum chalice-shaped, with a slender biarticulate palpus at each angle (fig. 10 *d*). Antennæ inserted at the base of the mandibles, on each side of the crown of the head, 4-jointed, basal joint short; 2nd quadrate; 3rd oval; 4th very slender and as long as the 3rd (fig. 10 *e*). Prothorax quadrate, two following segments transverse, punctured at the base, the membrane between the segments forming whitish bands. Abdomen composed of eight transverse segments, deeply and very coarsely punctured at the base, and a ninth forming the depressed apex, coarsely and irregularly punctured, and sometimes ferruginous; the centre depressed, the sides elevated and producing three teeth each, produced at the apex into two furcate lobes, leaving a circular space between them (fig. 11), with a short stout pro-leg beneath at the base (fig. 12, the same in profile); spiracles invisible after death. Legs very small, serrated beneath, with two series of spines at the base, and terminated by a curved claw. Underside more or less ochreous.

Having found the larvæ alive during my sojourn at Pau, in the south of France, I had an opportunity of examining the organs of the mouth in a living specimen, when they exhibited their full development. A description and figures, therefore, of this rare larva may be useful, notwithstanding the illustration of the species

by my distinguished friend Mr. Léon Dufour,* who entertains an idea that it is carnivorous. I wish also to make collectors acquainted with this larva, and its economy, hoping that it may lead to the capture of more specimens of the perfect insect.

I found these larvæ in the decayed wood of a felled tree, in March, and, like Messrs. Chapuis and Candèze, the evidence I have of their being the larvæ of *Athous rhombeus* is, my having found with them the thorax of that species, with the exuvia; but they certainly agree with the description and figure of *A. hirtus* of those authors,† as well as with De Geer's figure and description of *Elater undatus*.‡ M. Desvignes found in August the larva of *A. rhombeus* in a birch-tree in Sherwood Forest, and the pupa and imago in decayed oak branches.§

Family OPATRIDÆ.

Genus BOLITOPHAGUS, Ill., ELEDONA, Lat. (Pl. V. figs. 13 & 14.)

Sp. 3. *B. reticulatus*, Linn.; *crenatus*, Fab.

Soft, linear, curved in repose; white, with a few scattered hairs. Head orbicular, shining, horny, yellowish (fig. 15); eyes none. Labrum orbicular, bristly (fig. 17). Mandibles meeting, thick, very horny, bifid and pitchy (fig. 18). Maxillæ terminating in a large pilose oval lobe (fig. 19). Palpi stout and triarticulate, 2nd basal joints very thick, 3rd more slender, conical and terminated by a gland (fig. 19 a.) Labium subcordate. Palpi minute and biarticulate. Antennæ remote, inserted on each side of the mandibles, triarticulate, stout, especially the basal joint; 2nd oblong; 3rd longer and more slender, terminating in two unequal claws, one with a bristle at the apex (fig. 20). Thorax horny, suborbicular, concave before; the two following thoracic segments similar to those of the abdomen, but they are shorter, with a slate-coloured cloud on the back; abdominal segments fatty, the sides convex; the tail tapering, and furnished at each angle with a conical spine, with transverse striæ and horny at the tip (fig. 21). Stigma distinct. Legs sprawling, stout; coxæ large, very broad at the base; thighs robust, narrowed at the base; tibia slenderer, tapering, furnished with a horny claw (fig. 22, a middle leg).

Mr. Foxcroft found a very large old boletus upon a beech-tree in the Black Forest, Rannoch, Perthshire, which he conveyed to London, where he has been breeding the beetles, I believe, all the

* Annales des Sci. Nat. 2nd Series, vol. xiv. p. 41, pl. 3, B, f. 1—5.

† Catalogue des Larves, p. 144, pl. 5, fig. 1.

‡ De Geer's Mem. vol. iv. p. 155, pl. 5, fig. 23.

§ Entomologist, p. 188.

winter. I am not aware that the larvæ cut out cocoons in the curious way in which those of the *B. agaricola* form theirs, as observed by Mr. L. Dufour,* for I have not even seen the pupa. The larvæ are very active when taken from their cells, curling and jerking their bodies about when touched. They seem to differ from those of *B. agaricola* in having a styliiform tail. I was unable to give a highly magnified figure of the mentum with the lateral palpi, from having lost that portion in dissecting the head.

Family CUCUJIDÆ.

Genus PROSTOMIS, Lat. (Plate V. figs. 23 and 24.)

Sp. 5. *P. Mandibularis*, Fab.

Very depressed, elongate, white, shining, with a few scattered hairs. Head transverse, being twice as broad as long; eyes none (fig. 25). Mouth prominent, ferruginous; labrum semi-orbicular, fringed with bristles (fig. 26). Mandibles not large, crossing, outline sinuated, terminating in two sharp teeth, black at their tips, one mandible having a strong tooth towards the base (fig. 27). Maxillæ terminated by an oval lobe, irregularly fringed with bristly spines. Palpi composed of two oval and an elongated elliptical joint (fig. 28a). Mentum elongated, produced into a lobe in front, furnished with two parallel bristles. Palpi filiform, biarticulate, basal joint oblong; 2nd smaller, oval, with a bristle at the tip (fig. 29). Antennæ not short, placed on the anterior margin of the head, very remote, and not approaching the mandibles; they are quadriarticulate, the basal joint forming an ample scape, 2nd joint somewhat cup-shaped, 3rd elongate obconic, with a minute conical lobe at the apex, 4th joint placed close behind it, nearly as long as the 3rd, but slender and linear, with a few bristles at the apex (fig. 30). Thorax narrower than the head, with the alimentary canal shining through of an ochreous colour, often becoming black along the back; the prothorax and mesothorax are transverse oval, being united by a neck, which forms a projecting angle or acute tooth on each side; metathorax transverse, but narrowed only at the base. Abdomen formed of nine distinct segments, seven much broader than long, with two faint long spots on each, forming two lines down the back, 8th joint narrower, tapering, apical joint sub-orbicular, with two conical protuberances at the extremity, forming a concavity between them; the margins appearing tubercled when greatly magnified (fig. 31). Legs short and stout; coxæ sub-globose; thighs very clavate, tibiæ sub-ovate, with short spiny bristles; claws strong but very acute (fig. 32).

* Ann. des Sci. Nat. 2nd Series, vol. xx. p. 284, pl. 12, B.

This curious insect not having been yet discovered in Britain, I have added a figure of the beetle (fig. 33 *a*, the natural size); and as there are many peculiarities in its structure, and it departs considerably from the type of the *Cucujidae*, I have determined to add dissections of the mouth, which will be serviceable also in exhibiting the differences between the same insect in the larvæ and imago states. In fig. 34, which shows the underside of the head of the beetle, the two long processes, like bulls' horns, are very remarkable (fig. 34 *a*), and their use inconceivable, unless they are employed to divide the laminæ in the decayed trees, between which the *Prostomis* delights to nestle, in invisible spaces, which from its depressed form it is enabled to do, and the larvæ are still thinner, being apparently composed of nothing but their transparent horny covering, with an alimentary canal shining through. The labrum (fig. 35) is semi-orbicular, and attached to an elongated or lobe-shaped clypeus. The mandibles, which project, are unequal, one being very much dilated on the outside (fig. 36), and they have both a series of teeth on the inside, with larger ones at the apex. The maxillæ comprise two remarkably long lobes, the outer one articulated, at the base of which arises a still longer palpus of four joints (fig. 38). The labrum is singularly shaped, forming a flattened pointed tongue: the palpi are not attached to the base, and they are long and triarticulate (fig. 39). In the genus *Cucujus*, at least in the minute species I dissected in the British Entomology,* the jaws, although porrected, are not particularly developed, and they are notched internally, more like the *Heteromera*: the oral organs are not elongated, and all the palpi have fewer joints, viz. 3 and 2. It is evident that the great development in *Prostomis* is necessary to obviate the obstruction occasioned by the cephalic horns, and it is very singular that in the larva there is no indication of those processes. The beetle is furnished with ample wings, and the legs, like those of *Cucujus*, are very short; the hinder pair very remote, and it is perfectly tetramerous (fig. 40), whilst *Cucujus ferrugineus* or *C. testaceus* are pentamerous.

As *Prostomis* inhabits oaks and chesnuts, and is widely distributed in France and Germany, I hope it may some day find its way legitimately into our English fauna. The beetles with this larvæ were abundant near Pau in March, in the trunks of decaying and very aged chesnut trees. They preferred portions several feet from the ground, and were secreted between the lamina of the wood, where it was quite wet, rotten and soapy, resembling

* Curt. Brit. Ent. pl. and fol. 510.

chocolate-coloured mud. We never found them under the bark, which was an asylum, however, for another interesting beetle, the *Dryophthorus Lymexylon*, and amongst the dead leaves at the base of the tree was secreted the beautiful *Carabus splendens*. The capture of these insects adds to my pleasing recollections of a winter at Pau, where I could enjoy my favourite pursuits, even in the depth of winter and early spring, owing to the mildness of the climate and the splendid sun; and my rambles were rendered agreeable and profitable by the society of scientific friends, especially of Mr. Charles Delaronzée, a most zealous Entomologist and intelligent young man, to whom I am indebted for a knowledge of the *Prostomis* and its economy. He has since been elected into the Entomological Society of Paris, to become a valuable member of that excellent institution, and, I doubt not, he will be an honour to his country.

I will close this notice by stating, that when I had the pleasure of visiting M. Léon Dufour, at St. Sever, in the spring of last year, amongst many other interesting objects, he showed me some aquatic larvæ which had been alive two years, specimens of which I now exhibit. He had never succeeded in rearing them, nor had he any idea of their origin, beyond taking them from a brook upon some stones. Having attentively studied them, I am inclined to believe they are the larvæ of *Helophorus granularis*, Linn. I hope my estimable friend will eventually succeed in obtaining the beetles, and will add their history to the numerous and valuable discoveries he has made in insect economy.

EXPLANATION OF PLATE V.

- Fig. 1. Larva of *Velleius dilatatus*, Fab.; * natural length.
 Fig. 2. Underside of head; 2*a*, the antennæ.
 Fig. 3. The clypeus.
 Fig. 4. A mandible.
 Fig. 5. Maxillary palpus.
 Fig. 6. Mentum, labium and palpi.
 Fig. 7. Apex of abdomen; 7*a*, the proleg; 7*b*, the styles.
 Fig. 8. A leg; 8*a*, the coxæ; 8*b*, trochanter; 8*c*, femur; 8*d*, tibiæ; 8*e*, the claw.
 Fig. 9. Larva of *Athous rhombeus*, Oliv.
 Fig. 10. Upper side of head; 10*a*, mandibles; 10*c*, apex of maxillæ and palpi; 10*d*, labium and palpi; 10*e*, antennæ.
 Fig. 11. Apical segment of abdomen; upper side.
 Fig. 12. The same, in profile; 12*a*, the proleg.

- Fig. 13. Larva of *Bolitophagus reticulatus*, Linn.
 Fig. 14. The same magnified.
 Fig. 15. Upper side of head.
 Fig. 16. Under side of head.
 Fig. 17. The labrum.
 Fig. 18. A mandible.
 Fig. 19. Maxilla; 19 *a*, the palpus.
 Fig. 20. The antenna.
 Fig. 21. Apical segment of abdomen.
 Fig. 22. A middle leg.
 Fig. 23. Larva of *Prostomis mandibularis*, Fab.
 Fig. 24. The same magnified.
 Fig. 25. Upper side of head.
 Fig. 26. Labrum.
 Fig. 27. Mandible.
 Fig. 28. Maxilla; 28 *a*, the palpus.
 Fig. 29. Mentum and palpi.
 Fig. 30. Antenna.
 Fig. 31. Apex of abdomen.
 Fig. 32. Leg.
 Fig. 33. *Prostomis mandibularis*; • the natural length.
 Fig. 34. Head, viewed beneath; 34 *a*, the cephalic horns.
 Fig. 35. Labrum; 35 *a*, the clypeus.
 Figs. 36 and 37. A pair of mandibles.
 Fig. 38. Maxilla; 38 *a*, internal lobe; 38 *b*, external lobe; 38 *c*, palpus.
 Fig. 39. Mentum; 39 *a*, labium; 39 *b*, palpi.
 Fig. 40. A hind leg.
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